



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/923,530	08/07/2001	Lawrence D. Bergman	YOR920000742US1	2121

7590
Ryan, Mason & Lewis, LLP
90 Forest Avenue
Locust Valley, NY 11560

01/03/2007

EXAMINER

TO, BAOQUOC N

ART UNIT

PAPER NUMBER

2162

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/03/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 09/923,530	Applicant(s) BERGMAN ET AL.	
	Examiner Baoquoc N. To	Art Unit 2162	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-25 and 27-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-25 and 27-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/07/2006 has been entered.

Claims 1, 3-5, 7, 11-15, 19, 22, 25, 27-29, 31, 36-39, 43, 46 and 49 are amended and claims 2 and 26 are canceled in the amendment file on 12/07/2006. Claims 1, 3-25 and 27-49 are pending in this application.

Response to Arguments

2. Applicant's arguments with respect to claims 1, 25 and 49 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

3. Claims 7 and 12 are objected to because of the following informalities: claim 7 recites "the method of claim 1 wherein a scoring function is obtained for the each of the plurality of positive and negative example sets...", lines 1 and 2, and claim 12 recites "the method of claim 1, wherein a scoring function is computed...", in line 1 are lack of antecedent and basic as well as. Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

MPEP 2106 IV. B.2. (b)

A claim that requires one or more acts to be performed defines a process.

However, not all processes are statutory under 35 U.S.C. 101. *Schrader*, 22 F.3d at 296, 30 USPQ2d at 1460. To be statutory, a claimed computer-related process must either: (A) result in a physical transformation outside the computer for which a practical application in the technological arts is either disclosed in the specification or would have been known to a skilled artisan, or (B) be limited to a practical application within the technological arts.

4. Claim 49 in view of the above cited MPEP section, are not statutory because claims they merely recite computing steps without producing any concrete and useful result and/or being limited to a practical application within the technological arts. The article of manufacture has not being executed. The claims lack the necessary physical articles or objects to constitute a machine or a manufacture within the meaning of 35 USC 101. They are clearly not a series of steps or acts to be a process nor are they a combination of chemical compounds to be a composition of matter. As such, they fail to fall within a statutory category. They are, at best, functional descriptive material *per se*. Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." Both types of "descriptive material" are nonstatutory when claimed as descriptive material *per se*, 33 F.3d at 1360, 31 USPQ2d at 1759. When functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994). Merely claiming nonfunctional descriptive material, i.e., abstract ideas, stored on a computer-readable medium, in a computer, or on an

Art Unit: 2162

electromagnetic carrier signal, does not make it statutory. See *Diehr*, 450 U.S. at 185-86, 209 USPQ at 8 (noting that the claims for an algorithm in *Benson* were unpatentable as abstract ideas because "[t]he sole practical application of the algorithm was in connection with the programming of a general purpose computer.")

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1, 3-25 and 27-49 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: querying step in order to retrieve the data from the multidimensional data structure.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1, 3-25 and 27-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Acharya et al. (US. Patent No. 01/20/2004).

Regarding on claims 1, 25 and 49, Acharya teaches a computer-based method of retrieving one or more items from at least one database in response to a query specified by a user via a plurality of positive and negative example sets, the method comprising the steps of:

Constructing a scoring function from the plurality of positive and negative example sets (the covariance matrix may be computed for all images 30 of the database 40) (col. 5, lines 60-61), wherein the scoring function is operable for use with a multidimensional indexing structure (col. 7, lines 11-15) capable of supporting similarity queries and associated with the at least one database (database 40) (col. 5, line 41); and

Retrieving (selecting), via the multidimensional indexing structure, the one or more database items (images) that have the highest score as computed using the scoring function (col. 6, lines 36-40).

Acharya discloses scoring function to calculate images in database (col. 5, lines 10-65 and abstract) and query image retrieval using a multi dimensional indexing structure (col. 7, lines 50-54). Since Acharya discloses the scoring function at least one

or more images in stored in the database, thus these images are possible to be the negative and positive sample sets. Acharya does not explicitly teach scoring function from the plurality of positive and negative example sets, and wherein the scoring function is operable for use with a multidimensional indexing structure capable of supporting similarity query and associated with the at least one database. Chen further discloses scoring function from the plurality of positive and negative example sets (for application that provide positive and negative...", col. 3, lines 64-65 and calculation, col. 4, lines 9-14), and wherein the scoring function is operable for use with a multidimensional indexing structure capable of supporting similarity queries (sample query images) (col. 2, lines 54-65) and associated with the at least one database (database 16 and 18). Since Chen further discloses the scoring function and others feature required by the claimed limitation. The modification Acharya' system is required in order to allow the to calculate the similarity between the positive and negative example sets as taught by Chen to index these them in the multidimensional data structure for the purpose of enhance image search and retrieval system.

Regarding on claims 3 and 27, Acharya teaches the method of claim 2 1, the scoring function is constructed by combining respective scoring function of plurality of negative and positive example sets (the variance-covariance matrix may be computed for all the images 30 in database 40) (col. 5, lines 60-61).

Regarding on claims 4 and 28, Acharya does not explicitly teach combining the scoring functions of the plurality of positive and negative sets comprises the steps of: modifying the scoring functions of the plurality of positive and the negative example sets

Art Unit: 2162

so that the scoring functions of the positive example sets assign low scores to representative examples of the negative example sets, and so that the scoring functions of the negative example sets assign low scores to representative samples of the positive example sets; and combining the modified scoring functions of the plurality of positive example sets and the negative example sets. However, Chen teaches modifying the scoring functions of the plurality of positive and negative example sets so that the scoring functions of the positive example sets assign low scores to representative examples of the negative example sets, and so that the scoring functions of the negative example sets assign low scores to representative samples of the positive example sets; and combining the modified scoring functions of the plurality of positive example sets and the negative example (weighting factors are adjusted such that statistically common features dominate in the representative feature for next sample query images..." (col. 3, lines 21-63). This suggests feedback mechanism to adjust the score. Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention was made to modify Acharya's system modify the positive and negative samples as taught by Chen in order to allow ordering the images to improve the retrieval results.

Regarding on claims 5 and 29, Archarya teaches the method of claim 1, wherein the scoring function assign a score to an element of a search space associated with the at least one database equal to the minimum of: (1) the maximum of the scores assigned to the element by the scoring functions of the positive example sets (col. 6,

Art Unit: 2162

lines 50-67); and (ii) the minimum of one minus the scores assigned to the element by the scoring functions of the negative example sets (col. 6, lines 50-67).

Regarding on claims 6 and 30, Acharya teaches the method of claim 1, wherein the scoring function give higher scores to database items that are more closely related to the query than to the database items that are not as closely related to the query (col. 7, lines 30-39).

Regarding on claims 7 and 31, Acharya teaches the method of claim 1, wherein a scoring function is obtained for the each of the plurality of positive and negative example sets by:

Computing a characteristic example from the at least one example set (col. 7, lines 10-15);

Computing a dispersion characterization of the at least one example set in association with the characteristic example (col. 7, lines 10-15); and

Using the characteristic example, the dispersion characterization, and one or more samples from the database to compute the scoring function (col. 7, lines 10-15).

Regarding on claims 8 and 32, Acharya teaches the method of claim 7, wherein the characteristic example is a centroid, a median, or a node computed over at least a portion of the example set (col. 7, lines 10-15).

Regarding on claims 9 and 33, Acharya teaches the method of claim 7, wherein the dispersion characterization associated with the example set comprises a covariance matrix, a standard deviation, central moments, order statistic of differences, or third moments capturing asymmetry (col. 7, lines 10-17).

Regarding on claims 10 and 34, Acharya teaches the method of claim 7, wherein the step of using the characteristic example, the dispersion characterization, and one or more samples from the database to compute the scoring function further comprises computing weight distances between the characteristic example and the one or more samples from the database using the dispersion characterization to compute weights (col. 7, lines 10-15).

Regarding on claims 11 and 35, Acharya teaches the method of claim 10, weighted distances are Euclidean distances or Minkowsky distances (col. 7, lines 10-15).

Regarding on claims 12 and 36, Acharya teaches the method of claim 1, wherein a scoring function is computed for each of the plurality of positive and negative example sets by converting one or more semi-metrics obtained using each example set to one or more scores using a conversion function (col. 7, lines 10-15).

Regarding on claims 13 and 37, Acharya teaches the method of claim 12, wherein the semi-metrics are weighted Minkowsky distances from a representative samples in each of the plurality of positive and negative example sets, and further wherein weights are calculated using the examples in each example set (col. 7, lines 10-15).

Regarding on claims 14 and 38, Acharya teaches the method of claim 14, wherein the weights are the inverse of standard deviations of the examples in each example set (col. 7, lines 10-15).

Regarding on claims 15 and 39, Acharya teaches the method of claim 13, wherein the representative sample is a centroid of the examples in each example set (col. 7, lines 10-15).

Regarding on claims 16 and 40, Acharya teaches the method of claim 13, wherein the conversion function is monotonically non-increasing continuous function having a value equal to one at the origin and a value of zero at infinity (col. 7, lines 10-15).

Regarding on claims 17 and 41, Acharya teaches the method of claim 16, wherein the conversion function is a monotonically non-increasing continuous function having a value of one between zero and a first threshold value and a value of zero after a second threshold value (col. 7, lines 10-15).

Regarding on claims 18 and 42, Acharya teaches the method of claim 1, wherein the user specifies the number of items to retrieve from the database (col. 8, lines 9-26).

Regarding on claims 19 and 43, Acharya teaches the method of claim 1, wherein the retrieving step further comprises the step of searching the multidimensional indexing structure to retrieve from the database the items having the highest score (col. 7, lines 45-55).

Regarding on claims 20 and 44, Acharya teaches the method of claim 19, wherein the multidimensional indexing structure is used to execute different queries (col. 7, lines 45-55).

Regarding on claims 21 and 45, Acharya teaches the method of claim 19, wherein the multidimensional indexing structure is abased on a recursive partition of a

Art Unit: 2162

search space associated with the database using hyperlanes parallel to coordinate axes or surfaces other than hyperlanes parallel to coordinate axes (col. 7, lines 10-15).

Regarding on claims 22 and 46, Acharya teaches searching the multidimensional indexing structure comprises the steps of:

Using scoring functions of the plurality of positive and negative example sets to search a tree to identify candidate nodes (col. 7, lines 45-55); and

Using the scoring functions of the plurality of positive and negative example sets to score items stored at leaves of the multidimensional indexing structure (col. 7, lines 45-55).

Regarding on claims 23 and 47, Acharya teaches identifying candidate nodes comprises the steps of:

Computing for each scoring function of the positive example set, the maximum possible score of an item stored at the node or at one of the descendants of the node (col. 7, lines 10-15);

Computing the maximum of the maximum scores (col. 7, lines 10-15);

computing for each scoring function of the negative example sets, the minimum possible score of an item stored a the node or at one of the descendant of the node (col. 8, lines 14-25);

computing the minimum of: (i) the maximum of the maximum score; and (ii) the minimum of one minus the minimum scores (col. 8, lines 14-25);

declaring that a node is a candidate if the minimum is not smaller than the minimum of the scores in the current result set (col. 8, lines 14-25); and

Art Unit: 2162

declaring that the node is no a candidate otherwise (col. 8, lines 14-25).

Regarding on claims 24 and 48, Acharya teaches the search is performed by using the scoring functions of the negative example sets (col. 7, lines 55-63).

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Baoquoc N. To whose telephone number is at 571-272-4041, or unofficial fax number for the purpose of discussion (571) 273-4041 or via e-mail BaoquocN.To@uspto.gov. The examiner can normally be reached on Monday-Friday: 8:00 AM – 4:30 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached at 571-272-4107.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231.

The fax numbers for the organization where this application or proceeding is assigned are as follow:

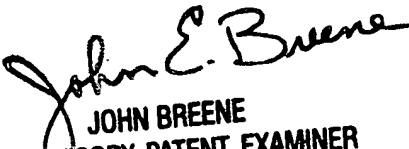
(571) –273-8300

[Official Communication]

BQ To

BQ

December 24th, 2006


JOHN BREENE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100